
Visit



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Current Targets

- Novel interface and easy communication between UV-CDAT and VisIt
- Provenance
- Provide Climate Science driven algorithms
 - Extreme Value Analysis
 - Peaks over Thresholds
 - Model-based clustering, ...
 - TECA
 - Extra Tropical Cyclone detection
 - Atmospheric River Detection,



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Climate Science Core Needs

- Customized interface that caters to climate science requirements
- Scalable & optimized analysis and visualization techniques.
- Diversifiable to meet needs to varying capabilities and support of wide range of sources (R, Python,)
- Customizable, in order to vary metrics of core algorithms in VisIt

Addressing Needs for the Community (UV-CDAT/VisIt) Integration

- Customizable and targeted user interface.
- Optimized and scalable visualization and analysis algorithms built within VisIt.
- Support for scripting in both R and Python allowing quick and thorough investigation of work. R and Python will both have MPI support enabled.
- Integration of VisIt algorithms with R/Python Kernels
 - Visit_foreach_location, Visit_foreach_time, Visit_foreach_file, etc...



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Addressing: Interface Needs

- Goal: Allow new UV-CDAT/VisIt capabilities to be intuitive and easy to use for the climate science community.
- Add Figure to show integrated interface..
- Add Figure to show communication pattern..

Addressing: Interface Needs

- Loose integration with UV-CDAT
 - Rendering done within UV-CDAT, Computation done externally.
- The PyQt infrastructure allows embedding, custom climate science interface, and seamless integration within environment
- The VisIt CLI interface provides control and response capabilities.

Addressing: Computational Needs

- Goal: Provide ability to extend climate science algorithms as well as create brand new ones with support of well supported programming environments (Python/R).
- Add Figure...

Addressing: Computational Needs (1)

- Integrating – TECA and R Code
- Parallelized and optimized for scalability and performance.
- Insert R scaling highlight figure...



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Addressing: Computational Needs

- Write Python or R code and embed it into VisIt's pipeline for extension of functionality.
- Invoke optimized VisIt templates that user generated execute kernels. Templates provide I/O, spatial, temporal, and windowing support.
- Create a call graph that links several kernels together allowing for rich & complex operations.
- Support for MPI in R and Python allowing users to parallelize kernels. (capable of parallelizing cdms)



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Use Case:

- Work with Chris to provide a use-case/workflow
- Insert Figure...



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